

Lessons Learned

- High Voltage System
 - Allow pouch cells to vent hydrogen better
 - Have battery box made out single piece of material
 - Find more rule-compliant material for the battery box
 - Document **everything** in ESF – More pictures of box during assembly, FEA design, etc
 - ESF will better match rules next year, they said
 - Make as-wired diagram of car
 - High voltage to low voltage converter for powering some battery box-specific lights
 - Increase spacing inside battery
 - New motor controller (that isn't a Kelly – old controller was killed by grounding the housing)
 - Possibly a Curtis or Curtis-Wright?
 - Use electrically-shielded cable, instead of housing the cable in conduits
 - Ask rules committee about high-voltage disconnect placement (and document)
 - Make a BMS test port
 - Get UL-listed accumulator charger
 - New high-voltage safety gloves – old ones are expired
- Low Voltage System
 - Improve the low-voltage board
 - Separate latching circuit from control circuit
 - Print PCBs instead of hand-making them
 - Do not leave until the night before competition
 - Put more work into the drive by wire code
 - Find better automotive connectors for the entire vehicle
 - Work on wire gauging and fusing – Make as uniform as possible
 - Color code and label wiring, then make cheat sheet
- Composites
 - Be sure of surface prep requirements before bonding
- Chassis
 - Judge said “Do not come back with this chassis next year, or it will not pass”
 - Current main roll hoop is out of spec – too short vertically
 - Front roll hoop is too close to the ground
 - Not welded correctly either - tubes need to either be parallel or be braced
 - Mounts for the harnesses are too high up. Need to move lower so harness pulls driver into seat
 - Make suspension tabs symmetrical, and be sure to meet wheelbase length requirements
- Brakes
 - Get commercial brake master cylinders
 - Bolts for attaching front brake disks to spindles are too close together
 - Floating rotors need new pins – Buy off the shelf or make groove for clip correctly
- Suspension
 - Reintroduce pull rods on rear suspension and use front and rear sway bars
 - Pull rod attachment to ball joint carrier needs to be stronger
 - Ball joint carriers need to be stronger
 - Get 10 inch wheels to replace the 13in ones
 - Space or move rod end tabs so that the rod ends can twist naturally
- Electric Propulsion

- Take a look at the coupling method
- ICE
 - Do noise testing to make sure muffler is good enough
 - Redesign exhaust to meet noise requirements
- Bodywork
 - Rules require low resistance from panel to ground on carbon fiber body (5 ohms max)
 - Front nose must be 30mm minimum radius on curves (No sharp edges)
- Overall
 - Test everything with enough time to fix it when it breaks
 - Under 500lb wet (Current is 515lb wet)
- Presentation
 - Better preparedness
 - Spend more time on macro project management
 - Goals, how you got there, and end result
- Design Review
 - Watch for poor communication from competition officials
 - Build on strong design report